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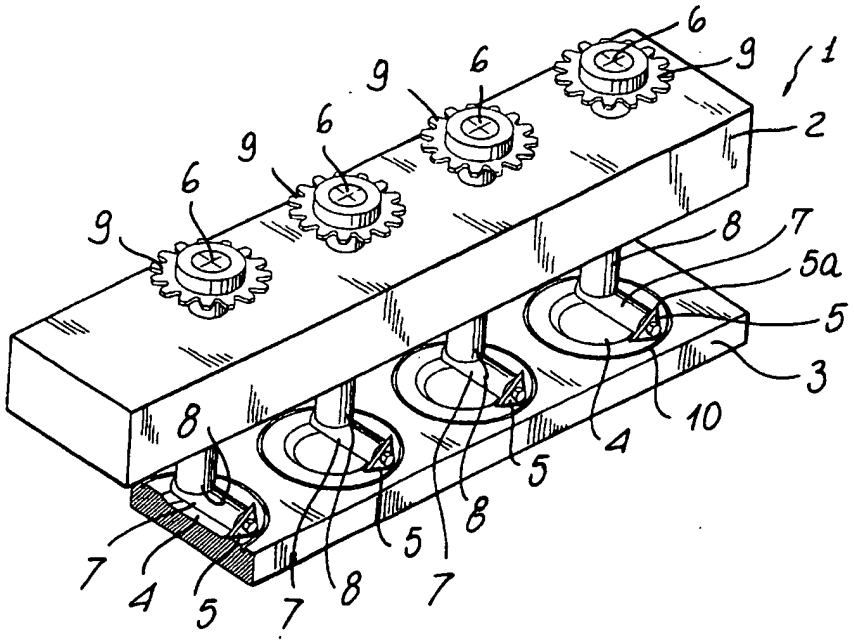
(54) Cutting device in apparatus for making coffee wafers for automatic espresso-coffee machines

(57) The present invention relates to a device (1) for cutting from a continuous web coffee wafers, either of round shape or not, for espresso-coffee automatic making machines.

The device comprises a supporting element (2) which can be faced to a plate (3), on the top face thereof provided for facing the supporting element, is provided at least a recess (4) for holding therein a coffee wafer, constituted by two permeable material film layers, including therebetween a pressed coffee dose and being sealed about the coffee dose, the sealed portion projecting about the recess. The supporting element supports at least a cutting blade (5) which can turn about an axis (6) substantially perpendicular to the top face of the plate, in order to affect a circular region about the recess in which is arranged the coffee wafer.



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BACKGROUND OF THE INVENTION

The present invention relates to a device for cutting from a continuous web coffee wafers, either of round shape or not, for espresso-coffee automatic making machines.

As is known, the coffee wafers or disc elements, to be used for making espresso-coffee by automatic espresso-coffee making machines, conventionally comprise two layers of a permeable material film, which enclose therebetween a pressed coffee dose and being sealed about said pressed coffee dose.

The above mentioned coffee wafers are conventionally made by suitable coffee wafer making machines, comprising a chain supporting a plurality of evenly spaced plates which are arranged at processing stations of the machine.

On the top face of these plates a recess is generally defined for receiving a coffee dose, after having deposited on said plates, in a first station of the machine, a permeable material film.

In the mentioned first processing station, a metering-delivering device is arranged, which delivers a preset amount of ground coffee on the permeable material film at a recess of a said plate.

In the mentioned first processing station, the coffee dose is at first pre-pressed and, in a subsequent station, the coffee dose is further pressed.

In yet another processing station of the machine, the thus pressed coffee dose is covered by a second permeable material film, which will be sealed to the film previously deposited on the plate about said coffee dose, so as to embed the pressed coffee dose between said permeable material films.

In a further station, arranged downstream of the film sealing station, the permeable film exceeding portion is cut away, so as to provide a finished coffee wafer to be used in automatic espresso-coffee making machines.

The excess film cutting operation, in conventional coffee wafer making machines, is usually performed by a cutting blade and a counter-cutting blade.

The provision of a blade and counter-blade assembly has the drawback that a comparatively high contact pressure is required, as well as being required expensive materials of a high hardness.

Moreover, the use of a blade and counterblade assembly will involve a high finishing degree of the cutting surfaces.

In other types of coffee wafer making machines, the permeable film excess portion is cut away by means of a die-punch assembly which, however, has the drawback of requiring a very high precision of the punching element guides, as well as a very high finishing degree of the cutting surfaces, with a consequent very high production cost.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a device allowing to very accurately cut away the excess film material in round coffee wafers, at the end of the making thereof, without requiring any mechanical contacts between movable parts of the device and which, moreover, does not need a very high finishing degree and accuracy of the components thereof.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a device the maintenance thereof can be performed in a very quick and easy manner.

Yet another object of the present invention is to provide such a device the cutting assembly whereof can be easily replaced, in a very quick and simple manner and at a very reduced cost.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a cutting device for cutting from a continuous web coffee wafers, either of round shape or not, for automatic espresso-coffee making machine, characterized in that said cutting device comprises a supporting element facing a plate on a top face thereof, provided for facing said supporting element, is formed at least a recess for holding therein a coffee wafer, comprising two permeable material film layers, enclosing therebetween a pressed coffee dose, said film layers being sealed about said coffee dose, and the sealed portion projecting about said recess.

The mentioned supporting element supports at least a cutting blade which can turn about an axis substantially perpendicular to the top face of said plate, in order to affect a circular region about said recess.

BRIEF DESCRIPTION OF THE DRAWING

Further characteristics and advantages of the cutting device according to the present invention will become more apparent hereinafter from the following detailed disclosure of a preferred, though not exclusive, embodiment thereof which is illustrated, by way of a merely indicative, but not limitative example, in the accompanying drawing, the sole figure whereof illustrates the subject device, by a partially cross-sectioned perspective view.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the number references of the above mentioned figure, the cutting device acccrding to the present invention, which has been generally indicated by the reference number 1, comprises a supporting element 2, having preferably a plate-like configuration, which is arranged at a processing station of a coffee wafer making machine, so as to cause the bottom surface

thereof to face the top face of plates 3 which are subsequently arranged at this station.

More specifically, the plates 3 can be connected, in a per se known manner, to a chain or other driving system, driving said plates to several processing stations of said coffee wafer making machine and being provided, on the top face thereof provided for facing the supporting element 2, with one or more recesses 4.

The latter are provided for receiving therein a ground coffee dose, after having deposited on said recesses a first permeable film layer.

In particular, the supporting element 2 supports a cutting blade 5 which can be controllably driven about a pivot axis 6, which is arranged substantially perpendicular to the top face of the plate 3.

As the cutting blade 5 is turned about its pivot axis 6, said cutting blade 5 will affect, by the cutting edge portion thereof, a circular region about the recess 4, so as to cut the excess portion of the two permeable material film layers embedding therebetween the coffee dose, which excess portion projects about the recess 4.

More specifically, the cutting blade 5 is removably connected to an end portion of an arm element 7 which extends perpendicularly or horizontally from the bottom end portion of a shaft 8 the axis thereof consists of the mentioned axis 6.

As the plate 3 is properly arranged with respect to the mentioned supporting element 2, the axis 6 will be arranged at the center of the recess 4.

As shown, the shaft 8 projects at the top from the supporting element 2 and, on the top end portion of said shaft is keyed a wheel or pinion 9, which is provided for rotatively driving the shaft 8 about the pivot axis 6, by driving means of any suitable known types and which have not been accordingly shown.

on the top face or surface of the plate 3 a circular slot 10 is formed, said slot extending about the recess 4 and being spaced at a set distance from the edge of said recess 4.

The mentioned slot 10 is provided for receiving the cutting edge of the cutting blade 5 as the cutting blade is turned about the pivot axis 6, i.e. during the cutting operation of the excess portion of the two film layers enclosing the coffee dose.

In the plate 3 several coffee dose receiving recess 4 can be formed, in a mutual adjoining relationship, as is clearly shown in the enclosed figure.

In this case, the supporting element 2 will support a plurality of cutting blades 5 which adjoin one another and can be rotatively driven about corresponding axes.

In particular, the cutting blade 5 is provided with a plurality of cutting edges 5a which, as the position of the cutting blade 5 with respect to the arm 7 is changed, can be brought to an use position, as the previously used cutting edge will be worn.

From the above disclosure and from an observation of the figures of the drawing, the great functionality and facility of use of the device according to the present invention will be self evident.

In particular, the fact is to be pointed out that a cutting device has been provided which will assure a very accurate cut, without requiring complex cutting operations, and which, accordingly, can be made at a comparatively low cost.

Moreover, the cutting blade of the subject device can be easily replaced at a low cost.

While the cutting device has been disclosed and illustrated with reference to a preferred embodiment thereof, it should be apparent that the disclosed embodiment is susceptible to several modifications and variations all of which will come within the spirit and scope of the appended claims.

Claims

1. A cutting device for cutting from a continuous web coffee wafers either round or not, for automatic espresso-coffee making machine, characterized in that said cutting device comprises a supporting element, facing a plate, on a top face of which, provided for facing said supporting element, is formed at least a recess for holding therein a coffee wafer, including two permeable material film layers, and enclosing a pressed coffee dose and sealed about said pressed coffee dose, a sealed portion projecting about said recess, said supporting element supporting at least a cutting blade which can turn about a pivot axis substantially perpendicular to the top face of the plate, so as to affect a circular region about said recess.

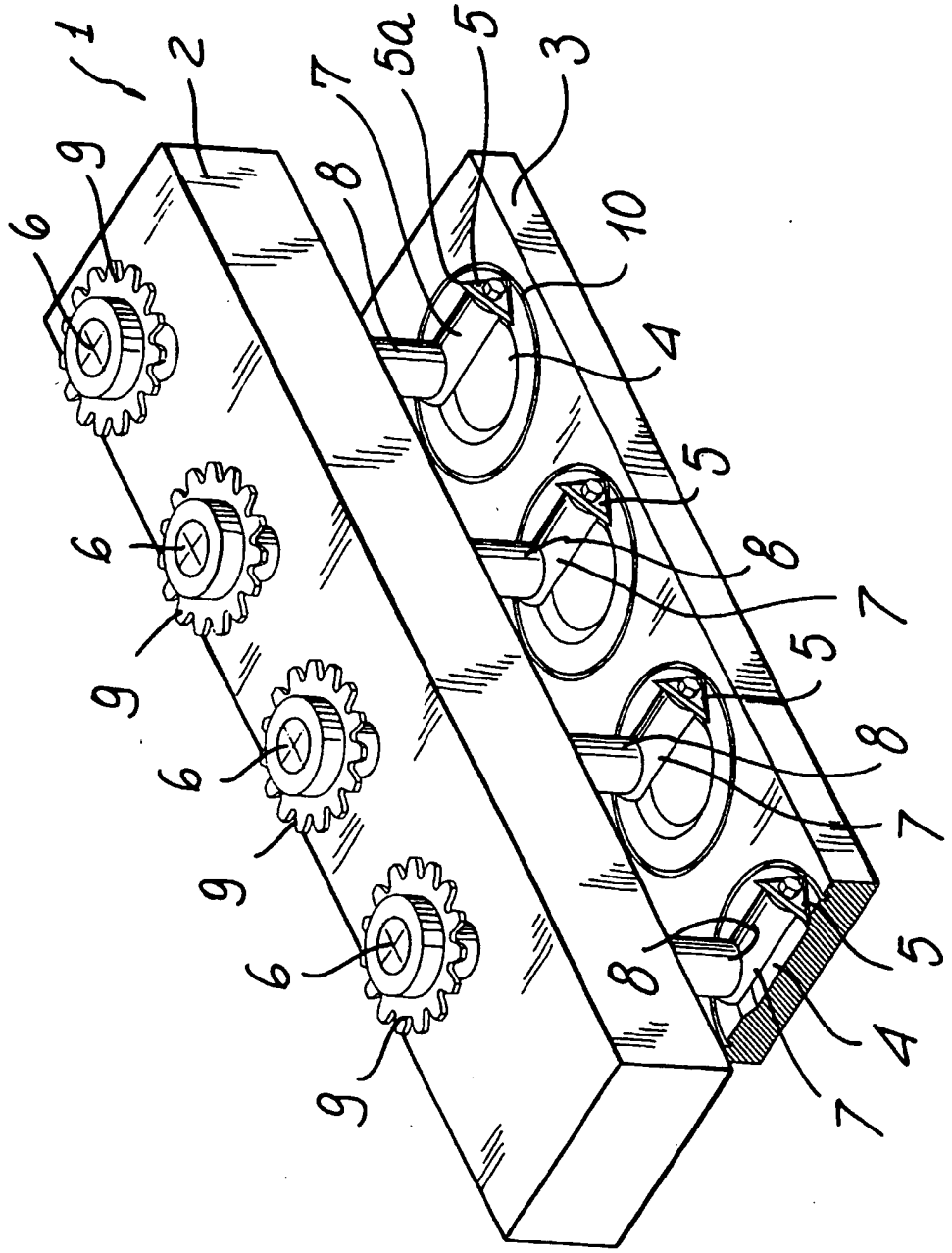
2. A device according to Claim 1, characterized in that on said plate, about said recess, a circular slot is provided, said circular slot receiving a cutting edge of said cutting blade as said cutting blade is turned about said pivot axis.

3. A device according to Claim 1, characterized in that said plate is provided with a plurality of adjoining recesses and that said supporting element supports a plurality of correspondingly arranged cutting blades which can turn about respective pivot axes.

4. A device according to Claim 1, characterized in that said cutting blade is mounted at an end portion of an arm element extending perpendicularly from a bottom end portion of a shaft perpendicular to said plate and rotatably supported by said supporting element.

5. A device according to Claim 4, characterized in that said shaft projects on the top of said supporting element and in that said shaft bears a gear wheel or pinion, which can be engaged with driving means for rotatively driving said shaft.

6. A device according to Claim 1, characterized in that said cutting blade is provided with a plurality of cutting edges which can be brought to a working position thereof by changing the position of the cutting blade with respect to the arm supporting said cutting blade.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EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0546

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Y	DE 27 33 626 A (KRÄMER & GREBE) * the whole document * ---	1-6	B65B61/08 B26F1/38
Y	US 3 736 722 A (NEW JERSEY MACHINE CORPORATION) * column 4, line 26-34; figures 1,2 * ---	1-6	
Y	DE 37 05 833 A (SCHÄDLICH) * column 3, line 51 - column 4, line 22; figure 1 * ---	3	
Y	US 3 648 365 A (PHILIP MORRIS INCORPORATED) * abstract; figure 8 * -----	6	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B65B
B26F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	25 March 1997	Lenoir, C

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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